CLAIMS

What is claimed is:

1. A method for measuring the position of an actuator, which has a coil that moves relative to a core of a magnet, comprising the following steps:

generating an alternating-current (AC) signal through the coil;

sensing current flow through the coil as a coil current signal;

generating a control signal as a function of the coil current signal and having a frequency corresponding to a position of the coil relative to the core;

generating the AC signal with the same frequency as the control signal; and

as a function of the frequency of the control signal, generating an output position signal indicating the position of the coil.

2. A method as in claim 1, further including the following steps:

generating a regulator output signal as a function of the difference between an input position set-point signal and the output position signal; and

generating the control signal as a function of the difference between the regulator output signal and the coil current signal.

3. A method as in claim 2, in which the step of generating the control signal comprises applying hysteresis to the regulator output signal before forming the difference between the regulator output signal and the coil current signal.

4. A method as in claim 1, further comprising the following steps:

measuring a temperature-induced change of resistivity of the coil;

calculating a temperature compensation factor; and

adjusting the control signal by the compensation factor.

5. A method as in claim 4, in which the step of measuring the temperature-induced change comprises measuring the temperature of the coil.

6. A method as in claim 4, in which the following steps:

measuring the temperature-induced change comprises measuring an average value of voltage over the coil and an average value of current through the coil; and

calculating the compensation factor as a predetermined function of the ratio between the average value of voltage and the average value of current.

7. A method for measuring the position of an actuator, which has a coil that moves relative to a core of a magnet, comprising the following steps:

controlling a force generated by the actuator by applying a DC driving voltage signal to the coil;

superimposing a constant-amplitude, sinusoidal voltage signal on the DC driving voltage signal;

measuring an alternating current (AC) coil signal through and an AC voltage signal of the coil;

measuring a phase shift between the AC coil signal and the AC voltage signal; and

calculating a position signal corresponding to a position of the coil relative to the core as a predetermined function of the phase shift.

8. A method as in claim 7, further comprising the following steps:

measuring a temperature-induced change of resistivity of the coil;

calculating a temperature compensation factor; and

adjusting the control signal by the compensation factor.

9. A method as in claim 8, in which the step of measuring the temperature-induced change comprises measuring the temperature of the coil.

10. A method as in claim 8, in which the following steps:

measuring the temperature-induced change comprises measuring an average value of voltage over the coil and an average value of current through the coil; and

calculating the compensation factor as a predetermined function of the ratio between the average value of voltage and the average value of current.

11. An arrangement for measuring the position of a voice-coil actuator, comprising:

a permanent magnet core;

a coil arranged to move relative to the core;

an oscillation circuit having, as a first input, an alternating-current (AC) signal corresponding to an instantaneous current flowing through the coil and having, as an output, a measurement output signal that has a frequency corresponding to the position of the coil relative to the core; and

a converter converting the frequency of the measurement output signal into a position output signal indicating the corresponding to the position of the coil relative to the core.

12. An arrangement as in claim 11, further comprising:

means for measuring a temperature-induced change of resistivity of the coil;

means for calculating a temperature compensation factor; and

means for adjusting the control signal by the compensation factor.

13. An arrangement as in claim 12, in which:

the means for measuring a temperature-induced change comprises means for an average value of voltage over the coil and an average value of current through the coil; and

the means for calculating a temperature compensation factor comprises means for calculating the compensation factor as a predetermined function of the ratio between the average value of voltage and the average value of current.

14. An arrangement as in claim 11, further comprising:

a regulator having, as a first input, a position set-point signal corresponding to a desired position of the coil; as a second input, the position output signal; and, as an output, a position difference signal;

a comparator having as a first input, the alternating-current (AC) signal; and, as an output, the measurement output signal;

a hysteresis arrangement connected between the output of the regulator and a second input of the comparator; and

a switching arrangement applying current of alternating polarity to the coil at a frequency equal to the frequency of the measurement output signal.